

Iron Workers catalog



MATRIX
Tooling for Punch Presses

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BASIC CONCEPTS

For over 20 years **MATRIX** has been manufacturing tooling for working metal sheet, availing of highly qualified technicians who constantly update their knowledge about the different needs of the production cycle.

MATRIX also invests in best technologies: from sophisticate software for projecting to the computerization of productions data, from planning to the final tests of the products.

All this allows our company to reach a high qualitative standard, certified by the system **ISO 9001:2000** and to obtain fast delivery times even on special tooling supplies.

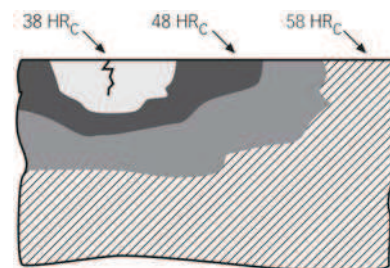
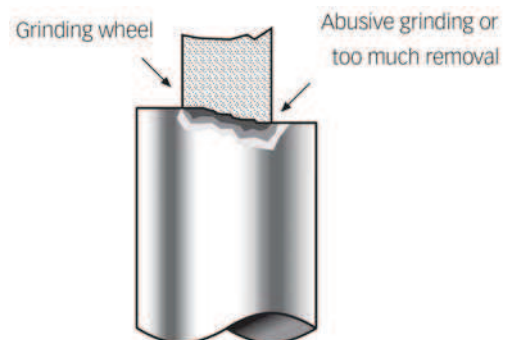
Often at the base of some damages to punches and dies, or to their limited life, we find causes probably of little account that must be intuitive; nevertheless these are often overlooked, except when you have to deal the consequences.

In most cases, an initial and periodical check on the following components and aspects may help to avoid some problems.

By initial check we mean careful cleaning of punch reductions, die holders, housing or machine turrets, and elimination of scraps or foreign bodies which can be the cause of tools breaking.

TOOLS SHARPENING AND WEAR

It is certainly advantageous to sharpen the tools at the first sign of wear because the removal will be minimum but also because the wear is exponential; that is the wear feeds itself in a progressive way producing a continuously lower ratio between tool price and number of strokes.



HRC = Rockwell "C" hardness of tool

BASIC CONCEPTS

LUBRICATION: INDISPENSABLE

Lubrication has an essential role in punching machines and particularly in punching stamps.

When the punch passes through the shearing material, small quantities of the material itself remains adherent to the surface of the punch.

Passing from one punching cycle to another, the material deposits layer after layer, causing a progressive increase in the diameter of the punch, although only hundredths of a millimeter.

This phenomenon triggers a recurrent cycle: the increase in the punch's diameter reduces the clearance and increases the material friction and therefore the phenomenon is inclined to expand.

A lubricant oil with proper characteristics acts as a barrier between the punch and the piece of material reducing in a significant way both friction and material accumulation on the punch surface, therefore increasing the life of the punch. Generally, the greater the viscosity is the greater the protection is against such a phenomenon. High viscosity is useful in the punch retraction phase.

PUNCHING AND NIBBLING OIL



TYPICAL CHARACTERISTICS

Appearance		limpid Fluid
Color		Amber-colored
Mass of a volume unit at 15°	cSt	1.045
Viscosity at 20° C	cSt	185
Viscosity at 40° C	cSt	53
Flash point P.M.	>	152° C

It is a special amber-coloured transparent fluid designed and created for technical problems of fine shearing.

The additive pack gives punches and dies long life and it also guarantees geometrical and dimensional accuracy and an excellent surface roughness on the shearing sections.

MTX 75 with its typical chemical and physical structure presents a low viscosity variation in relation to the operating temperature variation, and also good anti-rust property and an easy washability.

MTX 75 could be applied by spray, with a brush, or with a roller, but it is important to distribute it uniformly on the shearing surface.

ROUNDING OFF AND SMOOTHING

The life of a stamp could be considerably influenced by the shape of the hole to be punched. The geometry that involves sharp corners is less favorable by nature.

Wherever possible, it is necessary to smooth or round off these sharp corners. In the cases of square or rectangular holes, providing a 0,3÷0,5 mm minimum round off greatly helps the life of the tool.

BASIC CONCEPTS

MATERIAL HARDNESS

Punching is usually carried out on mild or low alloy steel. On material with an higher resistance there are difficulties, and the processing requires special punches which however sustain a greater wear.

In any case, the maximum load necessary to execute punching must be definitely lower than the punch maximum resistance to compression. The first is easily calculated multiplying the material thickness by its cut resistance and shearing perimeter.

The maximum compression load that the punch can tolerate depends on the type of steel and its hardness.

For instance, a hardened steel for tools resistant to collisions can tolerate a compression load of 2000 N/mm² before reaching the breaking point, and can be used with specific working pressure up to 1500 N/mm², therefore providing good results to the life of the tool.

When you place an order for a punching tool, it is recommended to specify the type of material and thickness that must be punched.

MATERIAL THICKNESS IN RELATION TO HOLE DIAMETER

Material thickness also plays its part both alone and in to the punching diameter. This is particularly valid when the diameter of punched holes is close to the metal sheet thickness value.

The resistance to compression limit remains if plates will have to exceed 40 Kg/mm².

A traditional rule says that the diameter of the punch must never be lower than the metal sheet thickness.

Nevertheless, with the advent of the hydraulic punching machine, it has become possible to adjust the impact speed between the punch and metal sheet more easily and so partially overcome that rule.

In various cases, although with very great stresses, holes are punched on materials with a thickness higher than the hole diameter.

However, in these conditions there are great stresses and consequently higher wear and the tool life is proportionally lower.

The same great stresses that occur in this case, require precautionary measures as well as respect for accident prevention norms, for instance the use of blockages and protections.

On the following pages there are some simple mathematical formulas to calculate the strength.

THE MACHINE OPERATOR, THE MOST IMPORTANT FACTOR

Even with all of the constructive devices on the front of the tools and machines, the machine operator probably remains the most important in considering the life of the stamp. In fact, he directly controls various factors not noticeable in other ways.

The correct use of a punching machine is a task which requires experience: first of all, the machine operator must be familiar with the machine, and be informed on the previous points and related operations.

Punching operations are developed, as seen, with extremely high specific pressures and stresses, so that the safety of the machine and the operator must be appropriately considered in respect to regulations in force, but also without forgetting to use the measures that are requested by particular environmental conditions not foreseen by legislation.

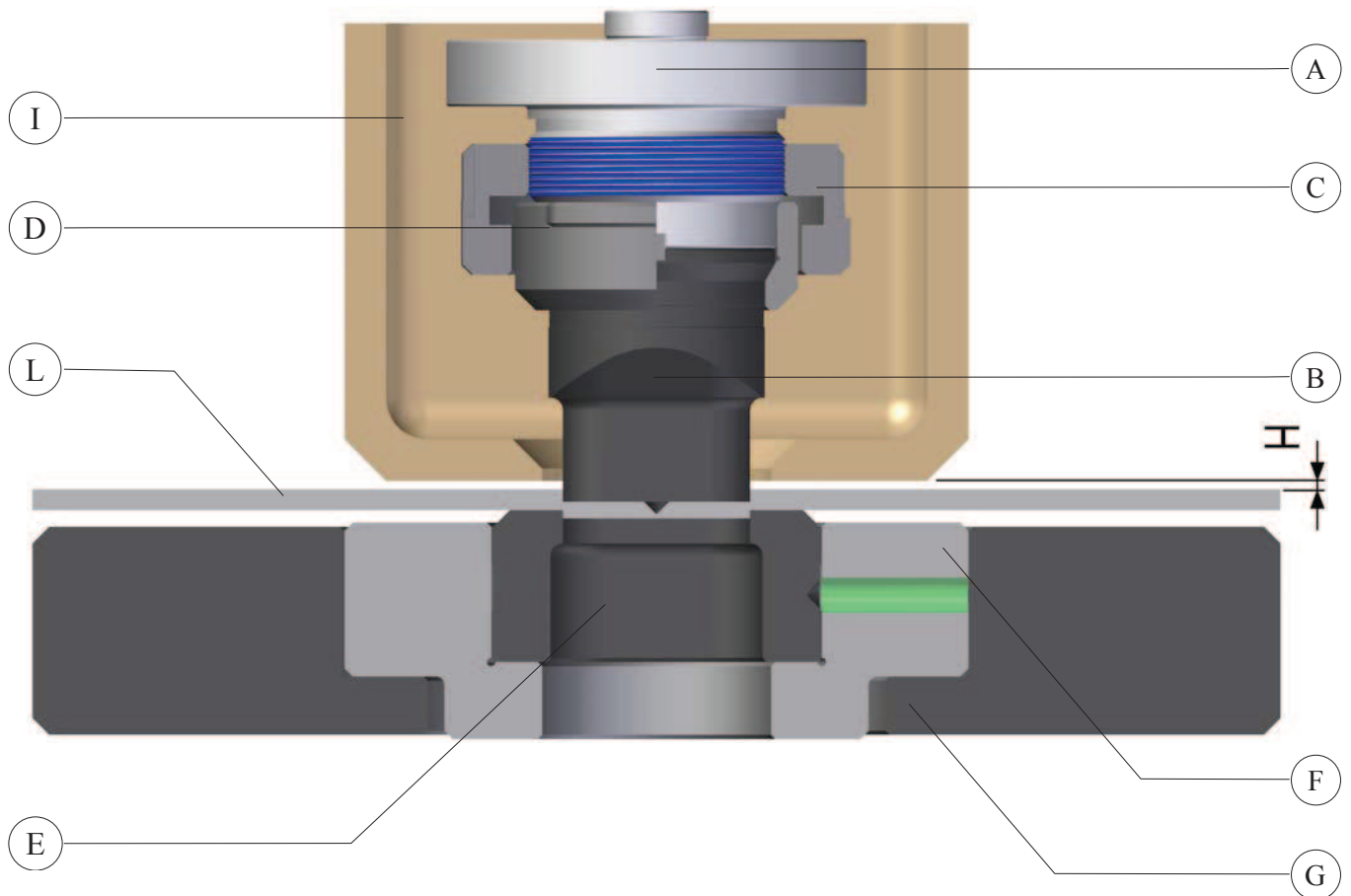
PUNCHES AND DIES

Punches and dies are manufactured in accordance with the most modern processes, as well as using a single type of steel (58WCr9KU), to guarantee the best performances on all types of material.

In punches production Matrix ensure the maximum care in dimensional and axial concentric accuracy, as well as in the roughness of the cutting part to guarantee its longer life.

Dies are tested with computerised systems and with hourly frequency to guarantee a very high reliability level.

BASIC CONCEPTS



A	Punch Holder
B	Punch
C	Punch Lock Ring Nut
D	Lock Sleeve
E	Die
F	Die Adaptor
G	Die Holder
H	Stripper - Plate distance: it must be as little as possible
I	Stripper
L	Plate

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BASIC CONCEPTS

PUNCH AND DIE ALIGNMENT

For a correct punching the punch must be well centred as regards the die.

Very often operators install both punch and die and they execute a rough centring rely on references (pins, etc.) that sometimes are predisposed and so they renounce to an accurate check.

In the least severe case the consequences are interference, scratches and chipping on one or both components.

Usually the punch is fasten on its bearing through a threaded component.

The punch holder transfers to the punch the shearing strength through a mutual contact surface.

Due to the high loads that transferred it is important that the surface is enough large to keep the specific pressure within acceptable values, but it is also important that the predisposed contact surface is really available, that is the surface must be flat and without damages or flatness defects.

In the above cases strength is not transferred to the punch along the axle but in an eccentric manner, consequently with an incorrect positioning as regards the die and so interference, scratches , etc.

CORRECT PUNCH CLAMPING

Even though punch clamping nut does not transfer the shearing strength, at last it and its tightening hold great importance as regards the stamp correct operation.

First of all, incidental imperfections on thread and its wear, damaged or irregular threads, or foreign matter could cause an insufficient or incorrect clamping.

Though the nut does not transfer the shearing strength, as previously mentioned, yet it is subject to a traction load when then punch is pulled out from the hole it has produced.

Therefore on each punching cycle there is not a negligible load application, with a "pulsating" nature. This effect is especially considerable on high thickness plate punching. The continuous pulsation of the load can cause elastic yielding and clamping loosening if the latter was not correctly accomplished (that is on closeness of thread yield limit).

PUNCH HOLDER

The punch holder is the system component which transfers to the punch the shearing strength. Usually the punch is harder than punch holder: so, light upsetting or interface surface wear phenomenon could take place.

If it happens then punch tends to incline as regards the geometrical axle of the stamp. An easy check with a comparator or a precision square allows to point out such anomalies immediately.

A lot of punch holders are fasten on the ironworker slide with bolt: sometimes this kind of clamping can fail while working, due to the pulsating loads and vibration that the machine is subject to. Therefore clamping need to be periodically checked, as well as references and centring systems integrity (pins, keys and the like).

REPLACE WORN-OUT DIE HOLDER

A correct die holder alignment is as important as the punch holder one.

Some ironworkers have two different die holders, one inside the other: the smaller is a component really subject to wear and can be substituted with a certain frequency. The most of the strength that is transferred from the punch to the sheet to shear, is then transferred to the die and so to the die holder.

The die has usually a greater hardness as regards the die holder, so also in this case, it is possible to have upsetting or wear with a consequent incorrect die positioning and the same inconveniences mentioned above.

Also bolt and nut that fasten the die holder to the ironworker board, are subject to pulsating loads and vibrations: clamping needs to be carry out in the right manner and periodically checked.

CLEARANCE CALCULATION AND CONTROL

(EXCESSIVE OR INSUFFICIENT CLEARANCE RESULT)

The clearance value between punch and die affects not only the life of these two components, but also the surface evenness of the sheared piece. In practice, clearance is fixed in accordance with the material thickness as well as its nature..

A correct clearance produces (on a mild steel sheet) holes in which the upper third of the height is cylindrical and properly sheared, while the lower two thirds are lightly conical and show tear signs (figure 1).

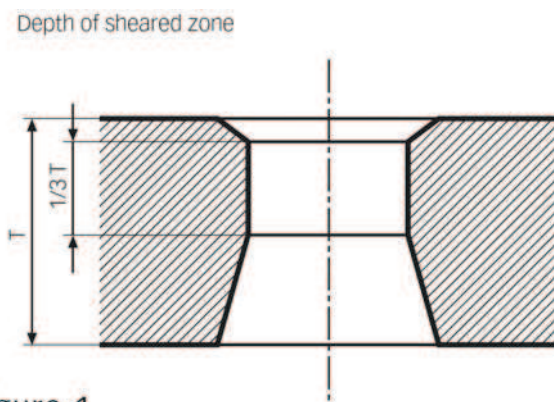


Figure 1

An inadequate clearance produces instead a secondary shearing effect which means additional wear on the punch. As previously said, the lack of lubrication contributes to a progressive spontaneous increase of the punch the diameter and therefore to a likewise progressive and spontaneous clearance reduction.

However, an excessive clearance produces holes with intermediate tear zone and, as a whole, a great loss of evenness on the surface (Figure 2).

On ironworkers standard clearances are used for any thickness or material, because usually, production occurs in limited series and so a compromise is accepted; it does not mean that a correct use of clearance leads to a higher productivity and a lower wear on tools.

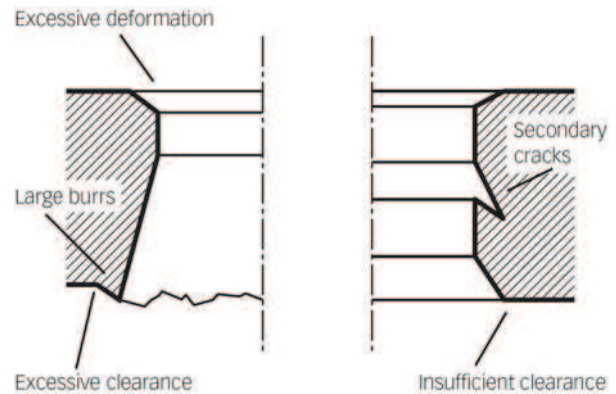


Figure 2

Quoted below is a table for die clearance calculation with regards the thickness and common types of material to be worked.

It is a table based on our own and our customer's experiences, in order to obtain the best quality on finished pieces and less wear on tools.

T	COPPER, BRASS, ALUMINIUM		MILD STEEL		STAINLESS STEEL	
	Hydraulic	Mechanical	Hydraulic	Mechanical	Hydraulic	Mechanical
1	0,3	0,3	0,3	0,3	0,3	0,3
1,2	0,3	0,3	0,3	0,3	0,3	0,3
1,5	0,3	0,3	0,3	0,3	0,3	0,3
2	0,3	0,3	0,4	0,4	0,4	0,4
2,5	0,4	0,4	0,5	0,5	0,5	0,5
3	0,5	0,5	0,6	0,6	0,6	0,6
3,5	0,5	0,5	0,6	0,6	0,6	0,6
4	0,6	0,6	0,8	0,8	0,8	0,8
5	0,7	0,7	1,0	1,0	1,0	1,0
6	0,8	0,8	1,0	1,0	1,0	1,0
7	1,0	1,0	1,0	1,0	1,0	1,0
8	1,0	1,0	1,0	1,0	1,0	1,0
10	1,0	1,0	1,0	1,5	1,5	2,0
12	1,5	1,5	1,5	1,5	2,0	2,0
14	1,8	1,8	2,0	2,0	2,0	2,5
15	2,0	2,0	2,0	3,0	2,5	3,0

T = Thickness in mm

PUNCHING STRAIN AND RELATED CALCULATIONS

TONNAGE GENERAL FORMULA

$$T = \frac{P \times R \times S}{1000}$$

T = Tonnage, P = Punch Perimeter, S = Material Thickness, R = Material Shear Resistance

PUNCHING STRAIN INDICATIVE TABLE WITH FLAT CUT ROUND TOOLS

Ø (mm)	MATERIAL THICKNESS (mm)																	
	1	1,5	2	2,5	3	4	5	6	7	8	9	10	12,5	15	17,5	20	22,5	25
4	0,50	0,75	1,00	1,25	1,50	2,00	-	-	-	-	-	-	-	-	-	-	-	-
8	1,00	1,50	2,00	2,50	3,00	4,00	5,00	6,00	7,00	8,00	-	-	-	-	-	-	-	-
10	1,25	1,86	2,50	3,13	3,75	5,00	6,25	7,50	8,75	10,00	11,30	12,50	-	-	-	-	-	-
12	1,50	2,25	3,00	3,75	4,50	6,00	7,50	9,00	10,50	12,00	13,50	15,00	18,80	-	-	-	-	-
14	1,76	2,63	3,52	4,40	5,28	7,04	8,80	10,60	21,70	14,10	15,90	17,60	22,00	26,04	30,80	-	-	-
16	2,01	3,02	4,02	5,03	6,03	8,04	10,10	12,10	14,10	16,10	18,10	20,10	25,20	30,60	34,20	40,20	-	-
18	2,26	3,39	4,52	5,65	6,78	9,04	11,30	13,60	15,90	18,10	20,40	22,60	28,30	33,90	39,60	45,20	50,90	-
20	2,51	3,77	5,02	6,28	7,53	10,10	12,60	15,10	17,60	20,10	22,60	25,10	31,40	37,70	44,00	50,20	56,50	62,80
24	3,02	4,53	6,04	7,55	9,06	12,10	15,10	18,20	21,20	24,20	27,20	30,20	37,80	45,30	52,90	60,40	68,00	75,50
30	3,77	5,66	7,54	9,43	11,30	15,10	18,90	22,70	26,40	30,20	34,00	37,70	47,20	56,60	66,00	75,40	84,90	94,30
40	5,03	7,55	10,10	12,60	15,10	20,10	25,60	30,20	35,20	40,30	45,30	50,30	62,80	75,40	88,00	100	113	-
45	5,65	8,48	11,30	14,20	17,00	22,60	28,30	33,90	39,60	45,20	50,90	56,50	70,70	84,80	99,00	113	127	-
50	6,28	9,42	12,60	15,70	18,90	25,20	31,40	37,70	44,00	50,30	56,60	62,80	78,60	94,30	110	126	141	-
55	6,91	10,40	13,80	17,30	20,80	27,70	34,60	41,50	48,40	55,30	62,20	69,10	86,40	103	121	138	-	-
60	7,53	11,30	15,10	18,90	22,60	30,20	37,70	45,20	52,70	60,30	67,80	75,30	94,30	113	132	151	-	-
65	8,17	12,30	16,40	20,50	24,50	32,70	40,90	49,10	57,20	65,40	73,60	81,70	102	123	143	163	-	-
70	8,80	13,20	17,60	22,00	26,40	35,20	44,00	52,80	61,60	70,40	79,20	88,00	109	132	154	-	-	-
80	10,10	15,20	20,20	25,30	30,30	40,40	50,50	60,60	70,70	80,80	90,00	101	126	151	176	-	-	-
90	11,30	17,00	22,60	28,30	33,90	45,20	56,50	67,80	79,10	90,40	102	113	141	170	-	-	-	-
100	12,60	18,90	25,20	31,50	37,80	50,40	63,00	75,60	88,20	101	113	126	157	189	-	-	-	-

This table has been compiled assuming R = 40 Kg/mm²

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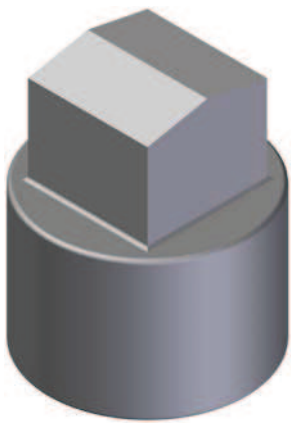
WHISPER SHARPENING

USE AND BENEFITS

With whisper sharpening we mean the various geometry of the punch upper face that are made only upon request.

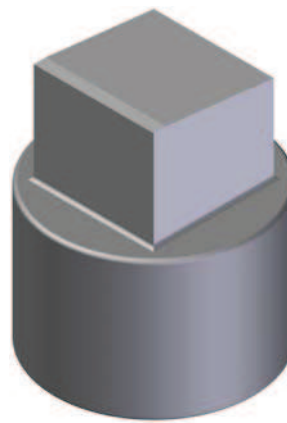
Sharpening benefits are:

- Tonnage reduction
- Scrap reclimbing reduction
- Ease of extraction
- Noise reduction
- Vibrations and counterblow reduction on all components of the machine.



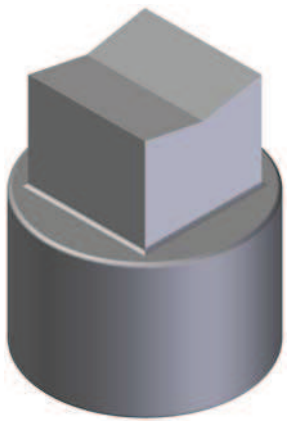
DWP

Double positive whisper:
for high thickness
and balanced load



WN

Negative whisper:
for high thickness and stiff
and fast machines
(the inclined sharpening
tends to shift the sheet)



WNT

Concave negative whisper:
for thin thickness and small
punch shape nibbling

Quoted below is an illustrative table showing tonnage reduction where we consider standard depth DWP sharpening.

Material Thickness in mm	1	1,5	2	2,5	3	4	5	6	7	8	10	12	14	16	18	20
% Tonnage reduction	60	50	40	35	25	20	15	15	15	15	15	15	15	15	15	15

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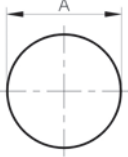
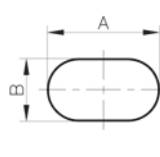
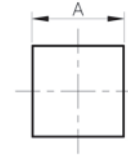
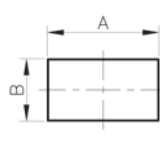
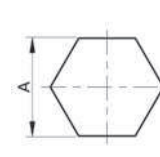
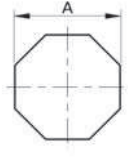
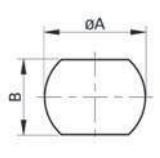
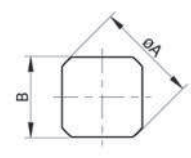
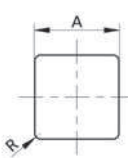
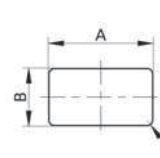
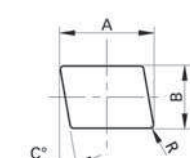
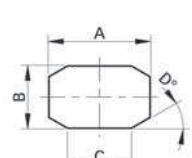
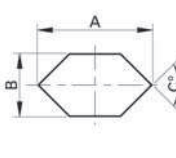
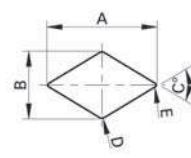
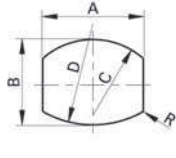
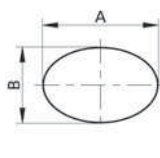
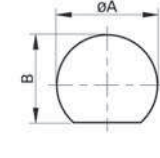
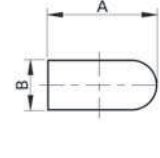
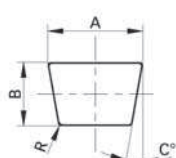
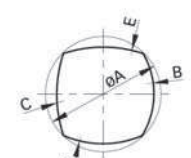
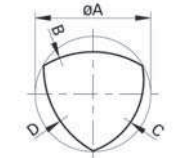
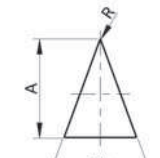
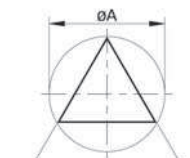
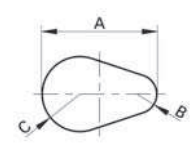
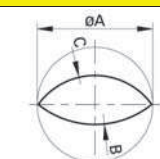
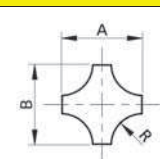
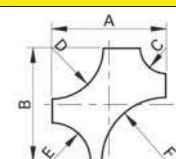
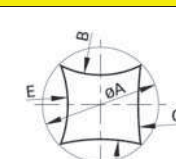
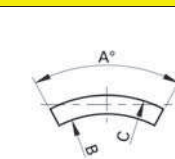
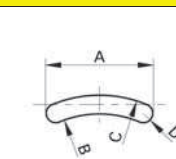
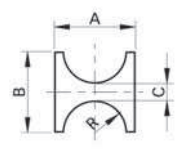
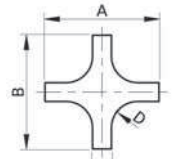
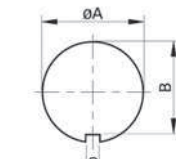
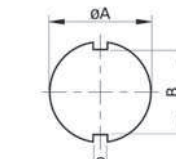
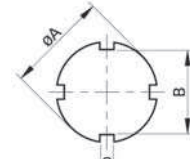
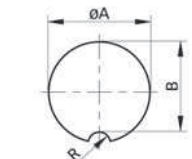
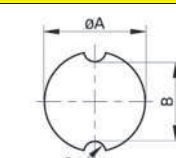
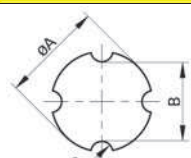
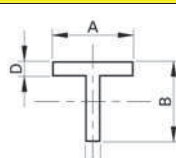
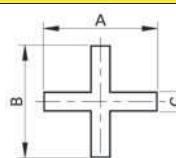
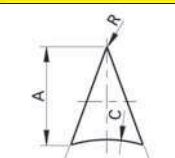
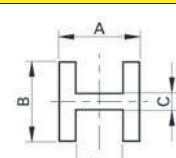


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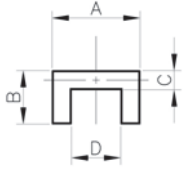
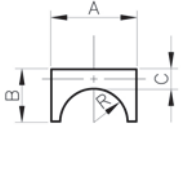
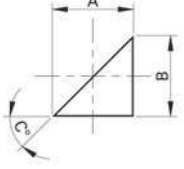
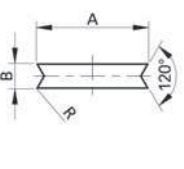
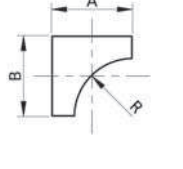
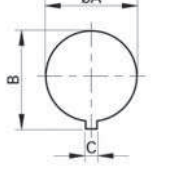
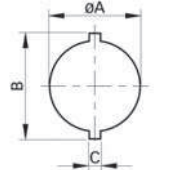
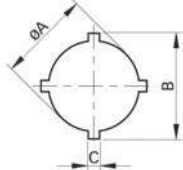
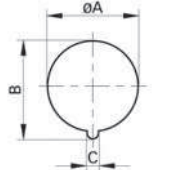
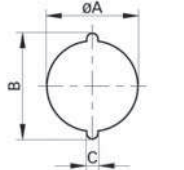
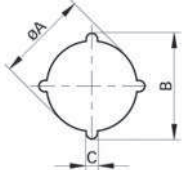
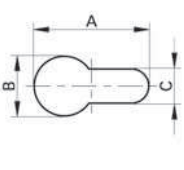
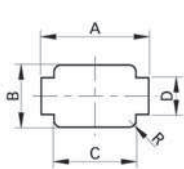
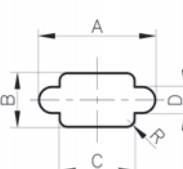
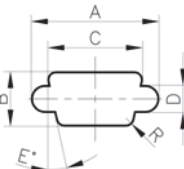
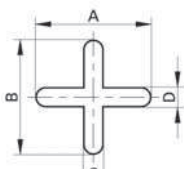
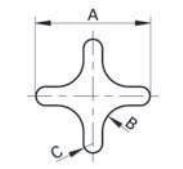
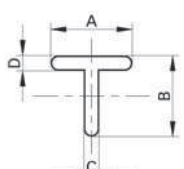
SOLUTIONS TO THE MOST COMMON PROBLEMS

Problem	Possible cause	Solution
Excessive burr	<ul style="list-style-type: none"> • Incorrect clearance between punch and die • Worn tools • Misaligned components (i.e.: adapters, and so on) 	<ul style="list-style-type: none"> • Restore correct clearance (See table) • Sharpen or replace tools • Check alignment
Punch or die breaking	<ul style="list-style-type: none"> • Incorrect clearance • Critical corners related to thickness • Punch Section inadequate to thickness 	<ul style="list-style-type: none"> • Restore correct clearance • Modify tooling with adequate radius • Contact technical office for more adequate tools feasibility
Punch breaking during extraction	<ul style="list-style-type: none"> • Lack of lubrication • Tough material • Ineffectual extraction system • Tooling limits 	<ul style="list-style-type: none"> • Lubricate • Revise clearance • Revise extraction system • See scheme on page 16, contact our technical office
Punch galling	<ul style="list-style-type: none"> • Insufficient die clearance • Lack of lubrication 	<ul style="list-style-type: none"> • Restore correct clearance • Lubricate or, if it is not possible, use coated punches
Excessive tool wear	<ul style="list-style-type: none"> • Incorrect clearance between punch and die • Tough or abrasive material • Misaligned components • Poor sharpening 	<ul style="list-style-type: none"> • Restore correct clearance • Contact technical office • Check alignment or perpendicularity • Check and carry out maintenance more frequently
Worked part deformation	<ul style="list-style-type: none"> • Incorrect clearance between punch and die • Lack of lubrication • Holes too close in sequence • Inadequate stripper 	<ul style="list-style-type: none"> • Restore correct clearance • Lubricate or use whisper sharpened punches • Reprogram alternating punching sequence • Contact technical office

SHAPES CODING

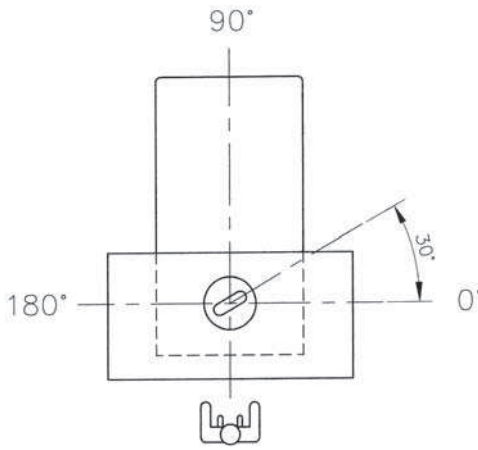
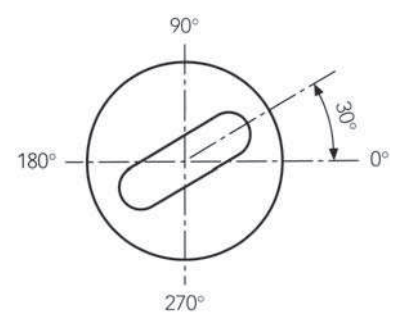
					
A0A	A0B	A0C	A0D	A01	A02
					
A03	A04	A05	A06	B01	B02
					
B03	B04	B05	B06	C01	C02
					
C03	C04	C05	C06	C07	C08
					
C09	C10	C11	C12	C13	C14
					
C15	C16	D01	D02	D03	D04
					
D05	D06	E01	E02	E03	E04

SHAPES CODING

					
E05	E06	F01	F02	G01	H01
					
H02	H03	H04	H05	H06	H07
					
H08	H09	H10	H11	H12	H13

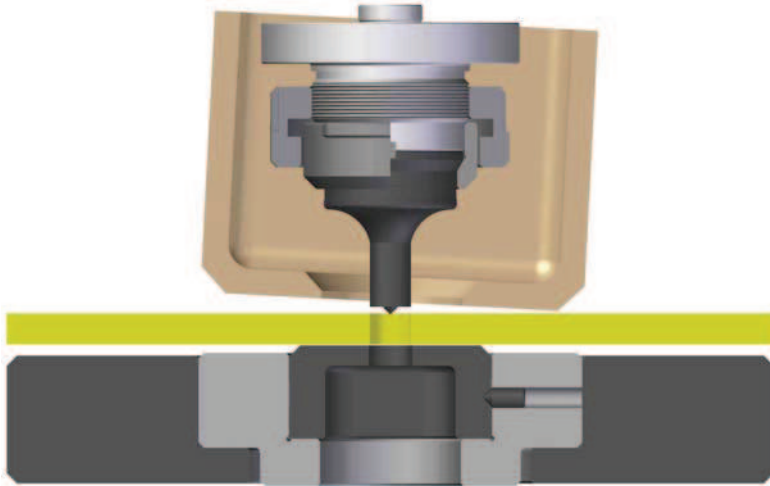
ANGLE SETTINGS

The diagram that follows is illustrative of angle settings.

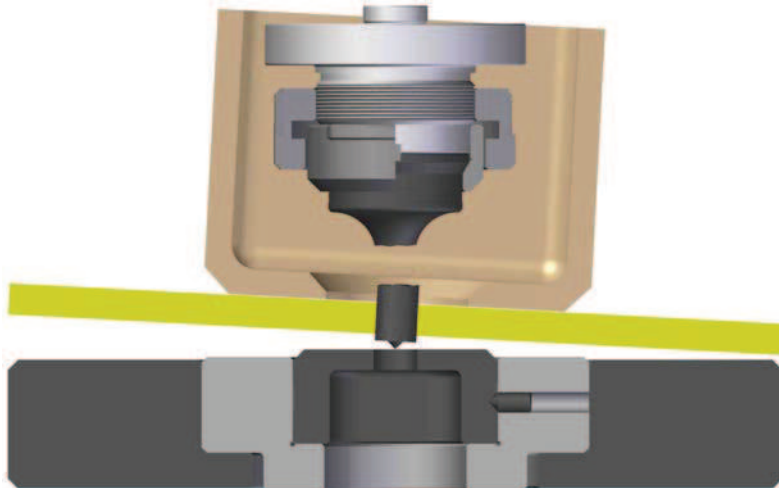
 <p>Top view of punch press</p>	<p>Attention: in case of order please specify the position of the references placed on the die housing of the machine (not only the shape orientation respect the die).</p>  <p>30° shape example</p>
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PUNCH'S BREAKING PROBLEMS DURING EXTRACTION

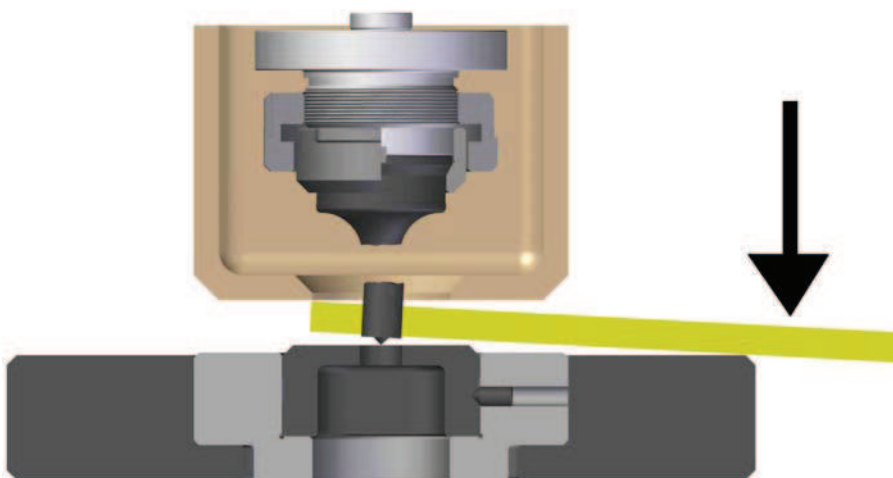
SLOPING STRIPPER



One of the problem that most frequently brings to tools breaking, is connected to a stripper incorrect inclination. If the latter is not perfectly perpendicular to the level of die and material to work with, as the image at side shows, the first phase of the punching processing could be correctly performed anyway.



Nevertheless the problem appears in all its seriousness during extraction. In fact, in such phase the stripper with an incorrect inclination comes in contact with the sheet, causing its inclination. The above situation tends to incline the punch as well; the latter, which has the cutting part inside the sheet, is subject to a great sollicitation that often causes breaking.



EMBOSSED WORK

Likewise the above situation, the punch is subject to a great sollicitation also when it works on a sheet displaced toward the outer edge of the work top, as the image at side shows. During the extraction phase the sheet tends to incline due to its weight, and so it repropose the same situation described above, that often cause the same result, that is the punch breaking.

GEKA IRONWORKERS TOOLS

In the following pages we present only the main tools from our range due to the extent of our production; actually, a large number of different models is available and the delivery time could be indicated by our sales department following your request.

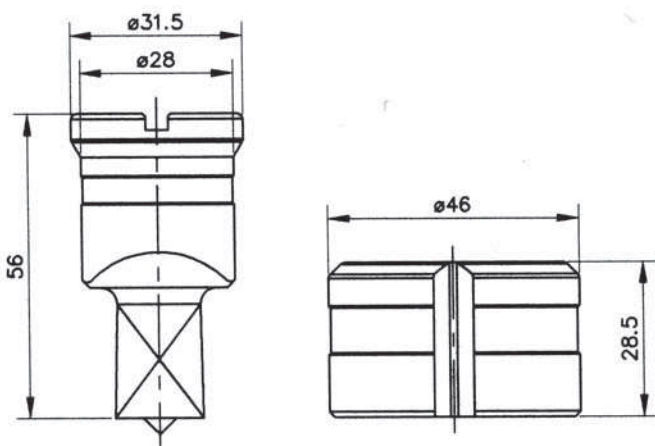
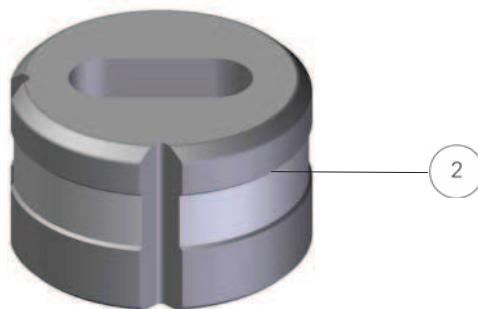
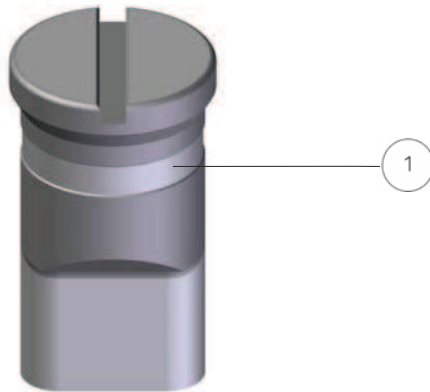
For some of the illustrated model the most used dimensions in the round shape, are usually available in stock ready for delivery; but due to the market variability we recommend to ask for a confirmation to our sales department, that is able to provide you with the shortest definite delivery date if the requested tools are temporarily missing.



GEKA - SERIES 6

IRONWORKERS TOOLS

MAX \varnothing \square = mm 28,0



POS.	CODE DESCRIPTION	PRICE
1a	F7410000.YYY Round Punch mm 5÷28	
2a	F7412W00.YYY Round Die mm 5÷28	
1b	F7420001.YYY Obround Punch max mm 28	
1c	F7420002.YYY Square Punch max diagonal mm 28	
1d	F7420003.YYY Rectangular Punch max diagonal mm 28	
2b	F743W01.YYY Obround Die max mm 28	
2c	F7422W02.YYY Square Die max diagonal mm 28	
2d	F7432W03.YYY Rectangular Die max diagonal mm 28	

For XX, YYY, W and ZZ variable meaning refer to page 75

OPTIONS

	Round punches and dies with measures lower than mm 5	
	Shaped punches and dies with minimum nominal measure lower than mm 5	
	Shaped dies with clearance lower or equal to mm 0,3	

TECHNICAL SPECIFICATIONS

- Punches and dies with a section lower than mm 5 are considered special.
- Dies, marked with real measure, are supplied with a mm 1 clearance, and on demand with a mm 0,5 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.

DIES EXTERNAL REFERENCES

	Round Die <ul style="list-style-type: none"> Reference: No Reference Maximum diameter mm 28,00
	Square Die <ul style="list-style-type: none"> Reference: 0° Maximum diagonal mm 28,00
	Obround - Rectangular Die <ul style="list-style-type: none"> Reference: 0° - 90° Maximum diagonal mm 28,00

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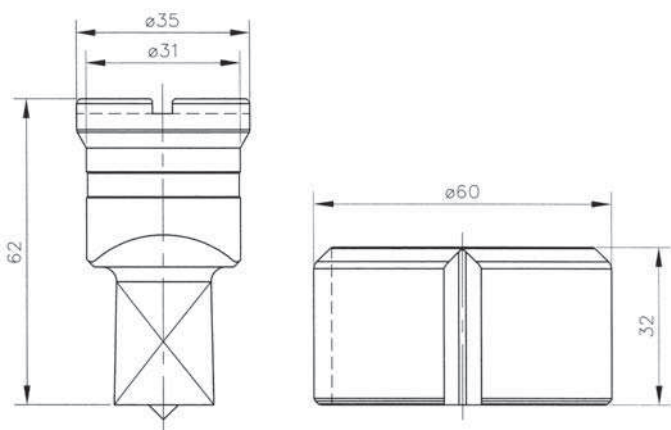
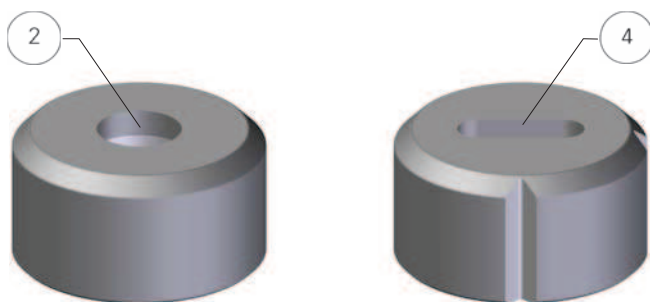
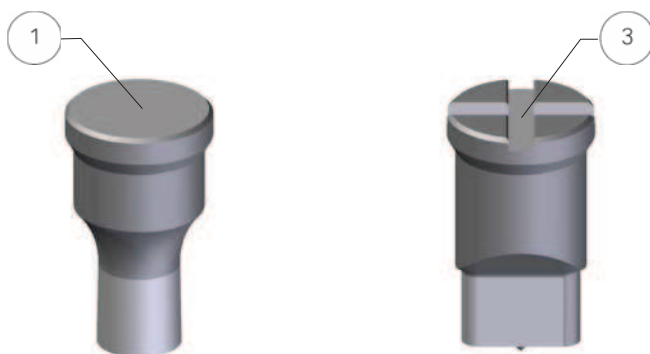


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GEKA - SERIES 8/31

IRONWORKERS TOOLS

MAX   = mm 31,0



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POS.	CODE DESCRIPTION	PRICE
1	F1560000.YYY Round Punch mm 19,1÷31 - Standard Measures	
2	F1602W00.YYY Round Die mm 5÷40 - Standard Measures	
3a	F1580001.YYY Obround Punch max mm 31 - Standard Measures	
3b	F1580002.YYY Square Punch max diagonal mm 31 - Standard Measures	
3c	F1580003.YYY Rectangular Punch max diagonal mm 31	
4a	F1622W01.YYY Obround Die max mm 40 - Standard Measures	
4b	F1622W02.YYY Square Die max diagonal mm 40 - Standard Measures	
4c	F1622W03.YYY Rectangular Die max diagonal mm 40	

For XX, YYY, W and ZZ variable meaning refer to page 75

OPTIONS

	Round punches and dies with non standard measures	
	Shaped punches and dies with non standard measures	
	Shaped dies with clearance lower or equal to mm 0,3	

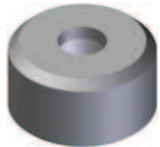

TECHNICAL SPECIFICATIONS

- If not expressly indicated in the order, round punches till mm 19 will be supplied as reduced.
- Dies, marked with real measure, are supplied with a mm 1 clearance, and on demand with a mm 0,5 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.



ATTENTION: Standard measures are the mainly used ones and the most common in the market.
To get the list and/or details, please feel free to contact our Sales dept.

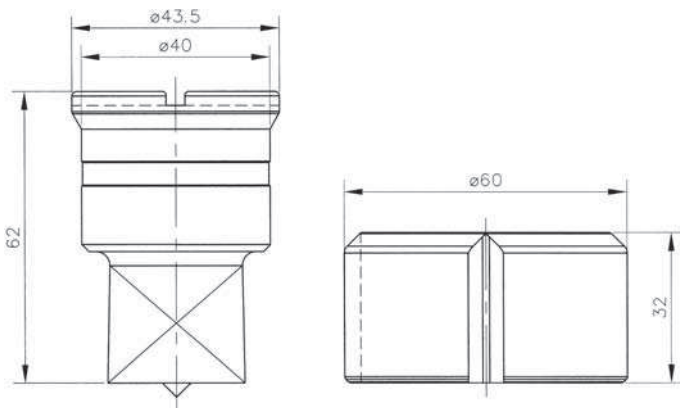
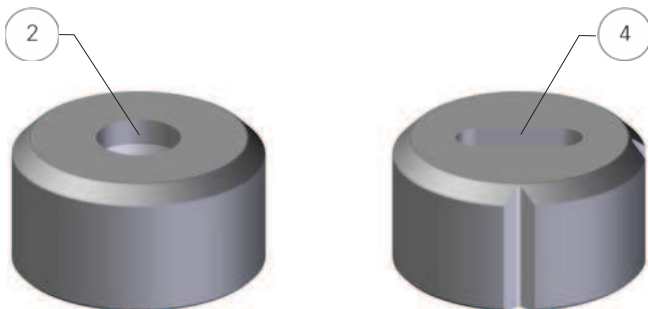
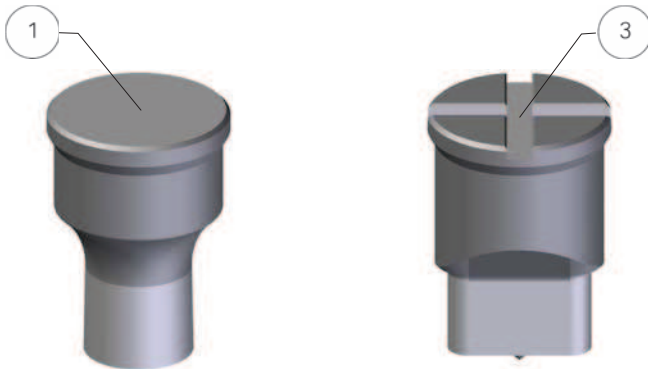
DIES EXTERNAL REFERENCES

	Round Die <ul style="list-style-type: none"> • Reference: No Reference • Maximum diameter mm 40,00
	Square Die <ul style="list-style-type: none"> • Reference: 0° • Maximum diagonal mm 40,00
	Obround - Rectangular Die <ul style="list-style-type: none"> • Reference: 0° - 90° • Maximum diagonal mm 40,00

GEKA - SERIES 8/40

IRONWORKERS TOOLS

MAX   = mm 40,0



POS.	CODE DESCRIPTION	PRICE
1	F160000.YYY Round Punch mm 31,1÷40 - Standard Measures	
2	F1602W00.YYY Round Die mm 5÷40 - Standard Measures	
3a	F1620001.YYY Obround Punch max mm 40 - Standard Measures	
3b	F1620002.YYY Square Punch max diagonal mm 40	
3c	F1620003.YYY Rectangular Punch max diagonal mm 40	
4a	F1622W01.YYY Obround Die max mm 40 - Standard Measures	
4b	F1622W02.YYY Square Die max diagonal mm 40	
4c	F1622W03.YYY Rectangular Die max diagonal mm 40	

For XX, YYY, W and ZZ variable meaning refer to page 75

OPTIONS

	Round punches and dies with non standard measures	
	Shaped punches and dies with non standard measures	
	Shaped dies with clearance lower or equal to mm 0,3	

TECHNICAL SPECIFICATIONS

- Dies, marked with real measure, are supplied with a mm 1 clearance, and on demand with a mm 0,5 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.



ATTENTION: Standard measures are the mainly used ones and the most common in the market.
To get the list and/or details, please feel free to contact our Sales dept.

DIES EXTERNAL REFERENCES

	<p>Round Die</p> <ul style="list-style-type: none"> • Reference: No Reference • Maximum diameter mm 40,00
	<p>Square Die</p> <ul style="list-style-type: none"> • Reference: 0° • Maximum diagonal mm 40,00
	<p>Obround - Rectangular Die</p> <ul style="list-style-type: none"> • Reference: 0° - 90° • Maximum diagonal mm 40,00

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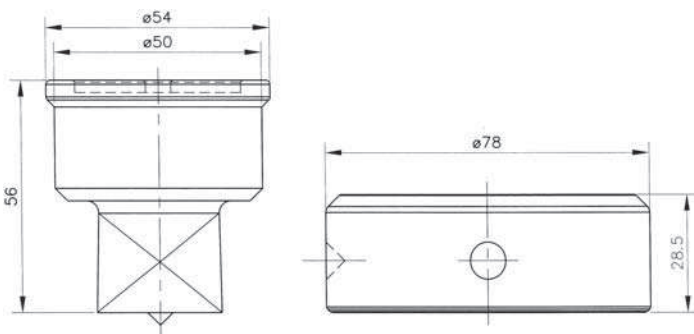
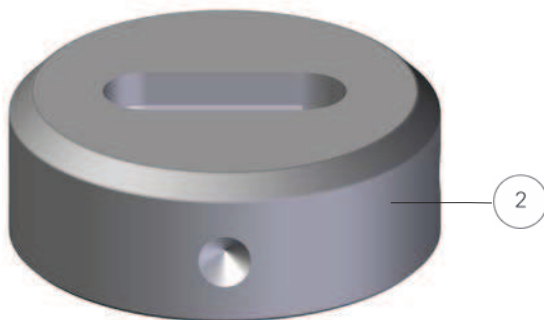
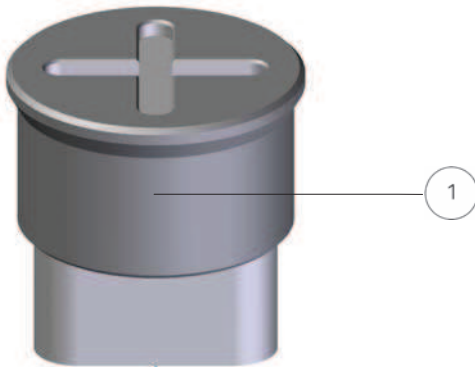


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GEKA - SERIES 11

IRONWORKERS TOOLS

MAX   = mm 50,0



POS.	CODE DESCRIPTION	PRICE
1	F1670000.YYY Round Punch mm 40,1+50	
2	F1672W00.YYY Round Die mm 40,1+50	
3a	F1690001.YYY Obround Punch max mm 50	
3b	F1690002.YYY Square Punch max diagonal mm 50	
3c	F1690003.YYY Rectangular Punch max diagonal mm 50	
4a	F1692W01.YYY Obround Die max mm 50	
4b	F1692W02.YYY Square Die max diagonal mm 50	
4c	F1692W03.YYY Rectangular Die max diagonal mm 50	

For XX, YYY, W and ZZ variable meaning refer to page 75

OPTIONS

	Round punches and dies with nominal measure lower than mm 40,1	
	Shaped punches and dies with minimum nominal measure lower than mm 5	
	Shaped dies with clearance lower or equal to mm 0,3	

TECHNICAL SPECIFICATIONS

- Punches and dies with a section lower than mm 5 are considered special.
- Dies, marked with real measure, are supplied with a mm 1 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.

DIES EXTERNAL REFERENCES

	<p>Round Die</p> <ul style="list-style-type: none"> • Reference: 0° • Maximum diameter mm 50,00
	<p>Square Die</p> <ul style="list-style-type: none"> • Reference: 0° • Maximum diagonal mm 50,00
	<p>Obround - Rectangular Die</p> <ul style="list-style-type: none"> • Reference: 0° - 90° • Maximum diagonal mm 50,00

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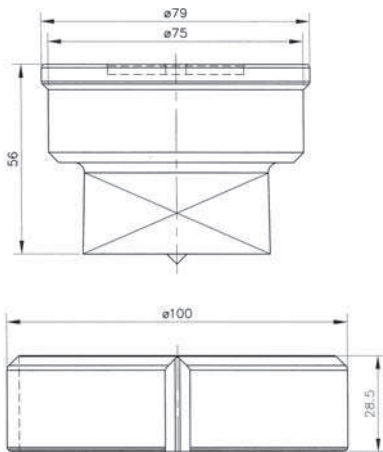
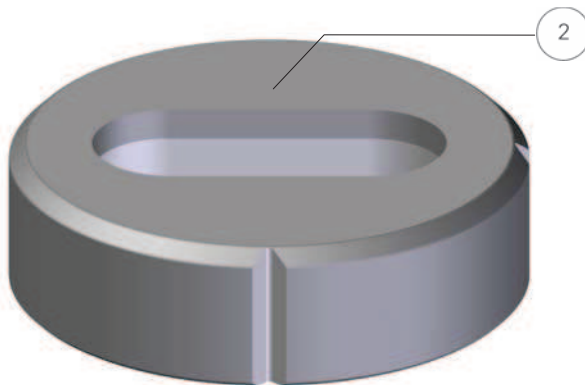
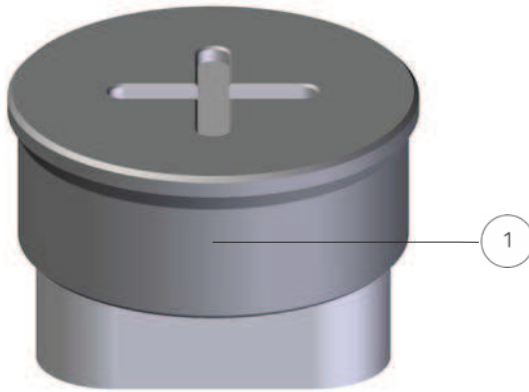


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GEKA - SERIES 12

IRONWORKERS TOOLS

MAX   = mm 75,0



POS.	CODE DESCRIPTION	PRICE
1	F170000.YYY Round Punch mm 50,1±75	
2	F1702W00.YYY Round Die mm 50,1±75	
3a	F1720001.YYY Obround Punch max mm 75	
3b	F1720002.YYY Square Punch max diagonal mm 75	
3c	F1720003.YYY Rectangular Punch max diagonal mm 75	
4a	F1722W01.YYY Obround Die max mm 75	
4b	F1722W02.YYY Square Die max diagonal mm 75	
4c	F1722W03.YYY Rectangular Die max diagonal mm 75	

For XX, YYY, W and ZZ variable meaning refer to page 75

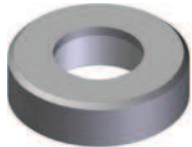


OPTIONS

	Round punches and dies with nominal measure lower than mm 50,1	
	Shaped punches and dies with minimum nominal measure lower than mm 5	
	Shaped dies with clearance lower or equal to mm 0,3	

TECHNICAL SPECIFICATIONS

- Punches and dies with a section lower than mm 5 are considered special.
- Dies, marked with real measure, are supplied with a mm 1 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.

DIES EXTERNAL REFERENCES

	Round Die <ul style="list-style-type: none"> • Reference: No Reference • Maximum diameter mm 75,00
	Square Die <ul style="list-style-type: none"> • Reference: 0° • Maximum diagonal mm 75,00
	Obround - Rectangular Die <ul style="list-style-type: none"> • Reference: 0° - 90° • Maximum diagonal mm 75,00

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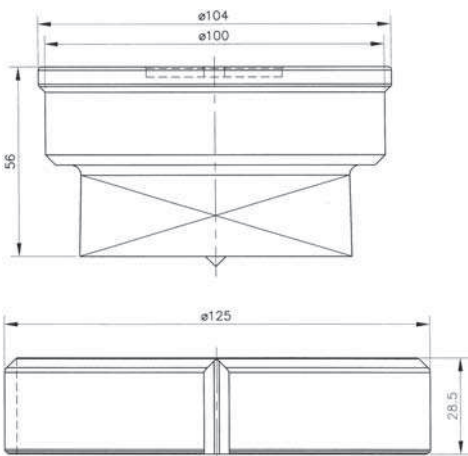
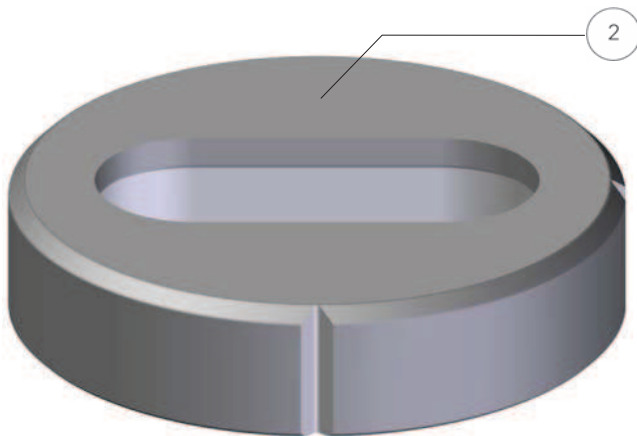
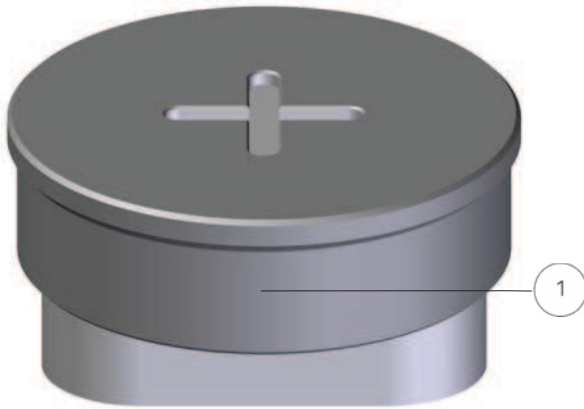


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GEKA - SERIES 13

IRONWORKERS TOOLS

MAX   = mm 100,0



POS.	CODE DESCRIPTION	PRICE
1	F1730000.YYY Round Punch mm 75,1±100	
2	F1732W00.YYY Round Die mm 75,1±100	
3a	F1750001.YYY Obround Punch max mm 100	
3b	F1750002.YYY Square Punch max diagonal mm 100	
3c	F1750003.YYY Rectangular Punch max diagonal mm 100	
4a	F1752W01.YYY Obround Die max mm 100	
4b	F1752W02.YYY Square Die max diagonal mm 100	
4c	F1752W03.YYY Rectangular Die max diagonal mm 100	

For XX, YYY, W and ZZ variable meaning refer to page 75




OPTIONS

	Round punches and dies with nominal measure lower than mm 75,1	
	Shaped punches and dies with minimum nominal measure lower than mm 5	
	Shaped dies with clearance lower or equal to mm 0,3	

TECHNICAL SPECIFICATIONS

- Punches and dies with a section lower than mm 5 are considered special.
- Dies, marked with real measure, are supplied with a mm 1 clearance.
- Punches and dies recommended maximum sharpening is mm 2.
- Punches and dies with additional references are available on demand.

DIES EXTERNAL REFERENCES

	<p>Round Die</p> <ul style="list-style-type: none"> • Reference: No Reference • Maximum diameter mm 100,00
	<p>Square Die</p> <ul style="list-style-type: none"> • Reference: 0° • Maximum diagonal mm 100,00
	<p>Obround - Rectangular Die</p> <ul style="list-style-type: none"> • Reference: 0° - 90° • Maximum diagonal mm 100,00

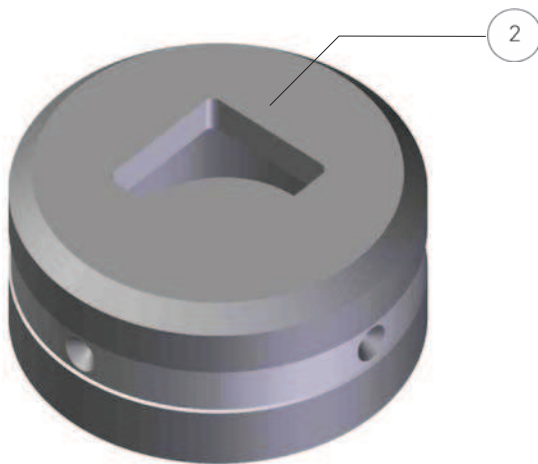
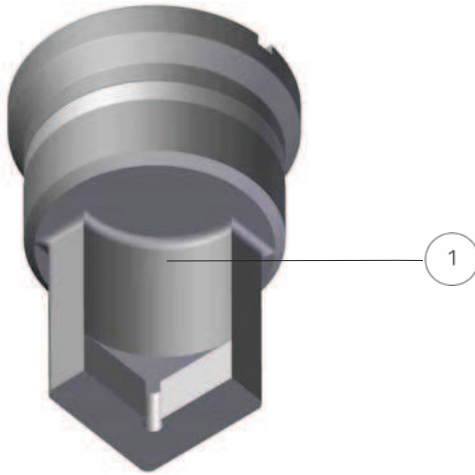
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SPECIAL TOOLS

SINGLE CORNER ROUNDING TOOL



POS.	DESCRIPTION
1	Punch
2	Die

TECHNICAL SPECIFICATION

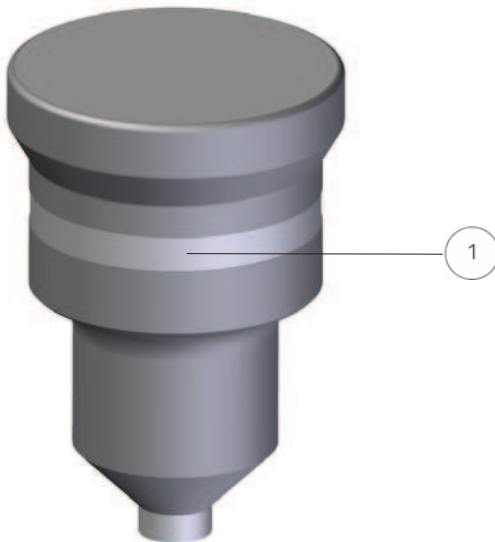
- Tool to make single rounding on plate corners.
- The punch is guided by the die, so that side flexion on the ironworker is limited and an excellent outcome is guarantee on the produced part.

OUTOCOME

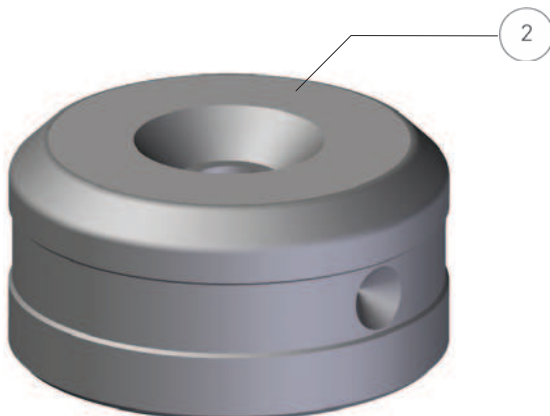


SPECIAL TOOLS

CONTERSINK TOOL



1



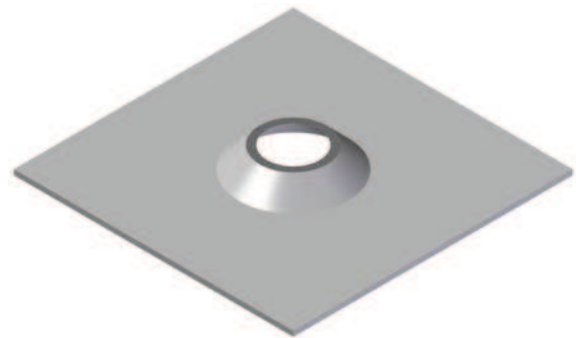
2

POS.	DESCRIPTION
1	Punch
2	Die

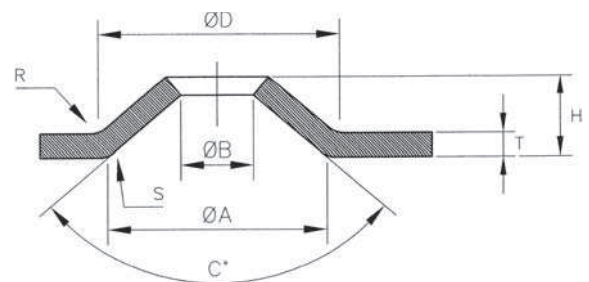
TECHNICAL SPECIFICATION

- The tool allows to perform in a single stroke of both an hole and a down-forming deformation.
- Usually it is used to embed flat head screws or to make anti-slip footboard.

OUTCOME

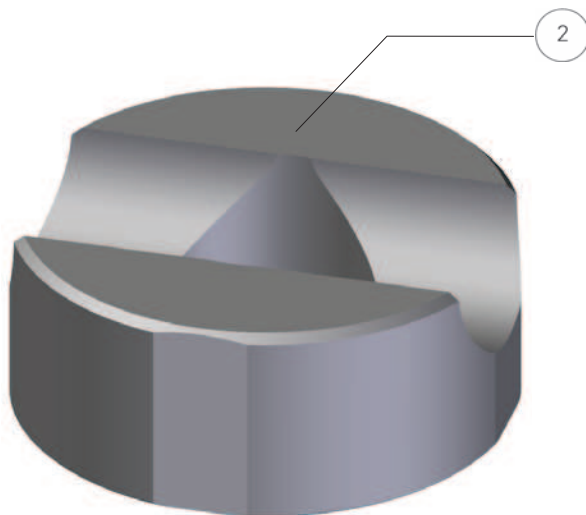
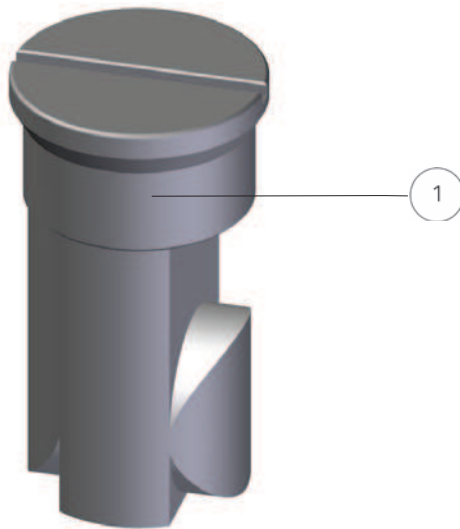


NOTE: To show clearly the outcome that can be obtained with this kind of tool, the image shows turned upside down while actually it is made down-forming.



SPECIAL TOOL

TUBE FACING TOOL

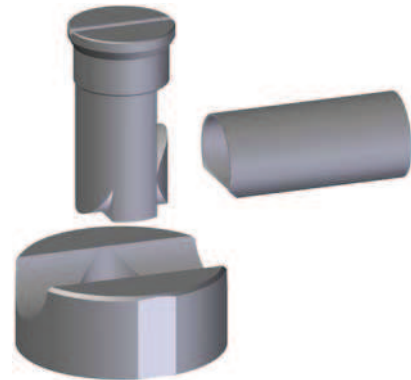


POS.	DESCRIPTION
1	Punch
2	Die

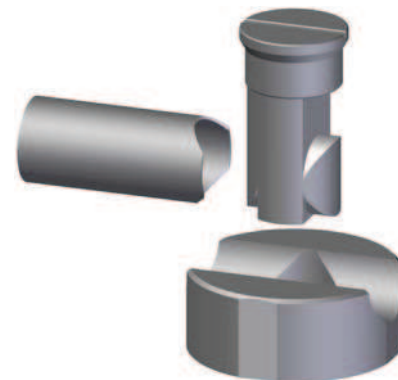
TECHNICAL SPECIFICATION

- The tool allows to make the shearing necessary to prepare a tube for a subsequent high quality T facing.
- A single tool, thanks to different shapes of the two available cutting parts, allows to make the expected shearing in two strokes only.

FIRST STROKE



SECOND STROKE

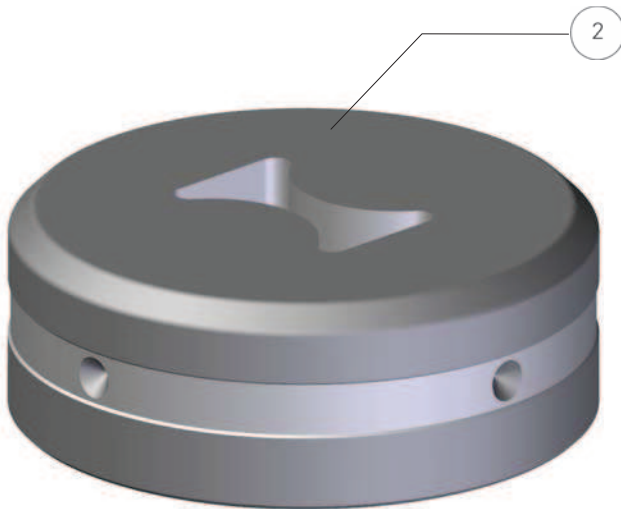
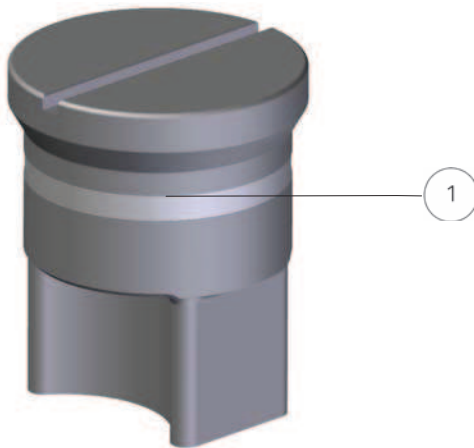


OUTCOME



SPECIAL TOOL

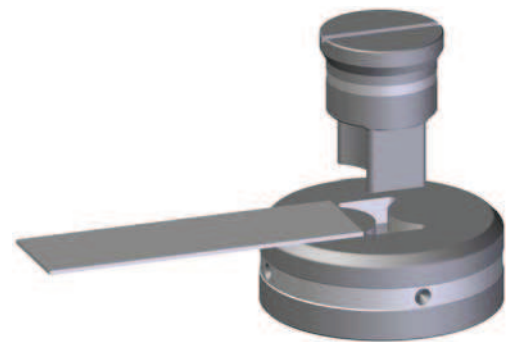
2-WAY RADIUS



POS.	DESCRIPTION
1	Punch
2	Die

TECHNICAL SPECIFICATION

- The tool allows simultaneous rounding off and shearing of different thickness sheets; sole precaution is the obligation to use the whole tool (it is not possible to use it to round off one side only).

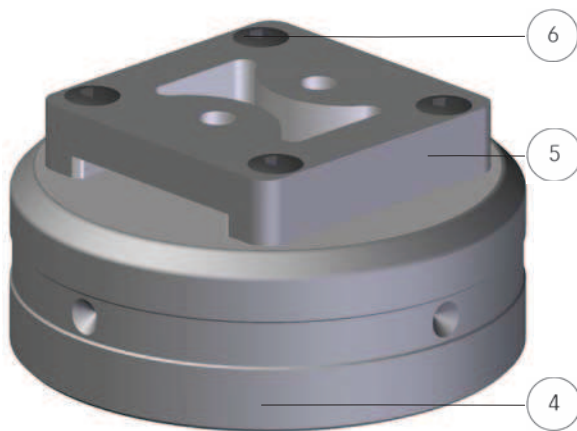
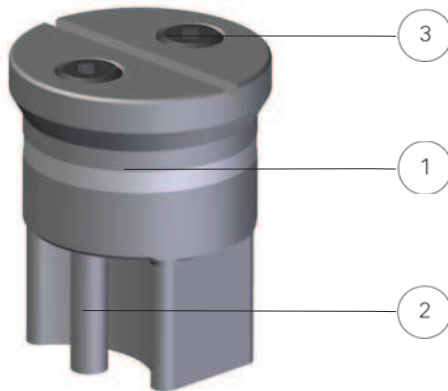


OUTCOME



SPECIAL TOOL

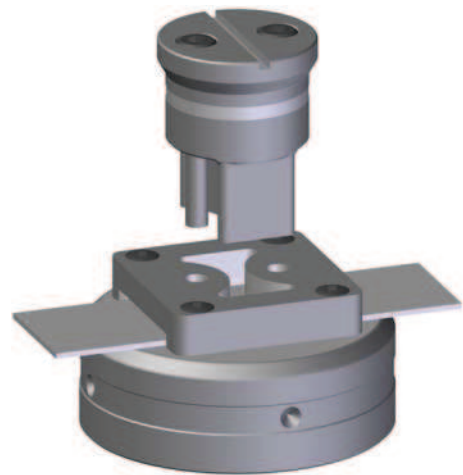
2-WAY RADIUS WITH HOLES



POS.	DESCRIPTION
1	Punch
2	Round Insert
3	2 x Socket Set Screw
4	Die
5	Punch Guide
6	4 x Screw

TECHNICAL SPECIFICATION

- The tool allows to make finished part in a single stroke.
- It is possible to make different kind of rounding off and holes or shearing mixed with holes.

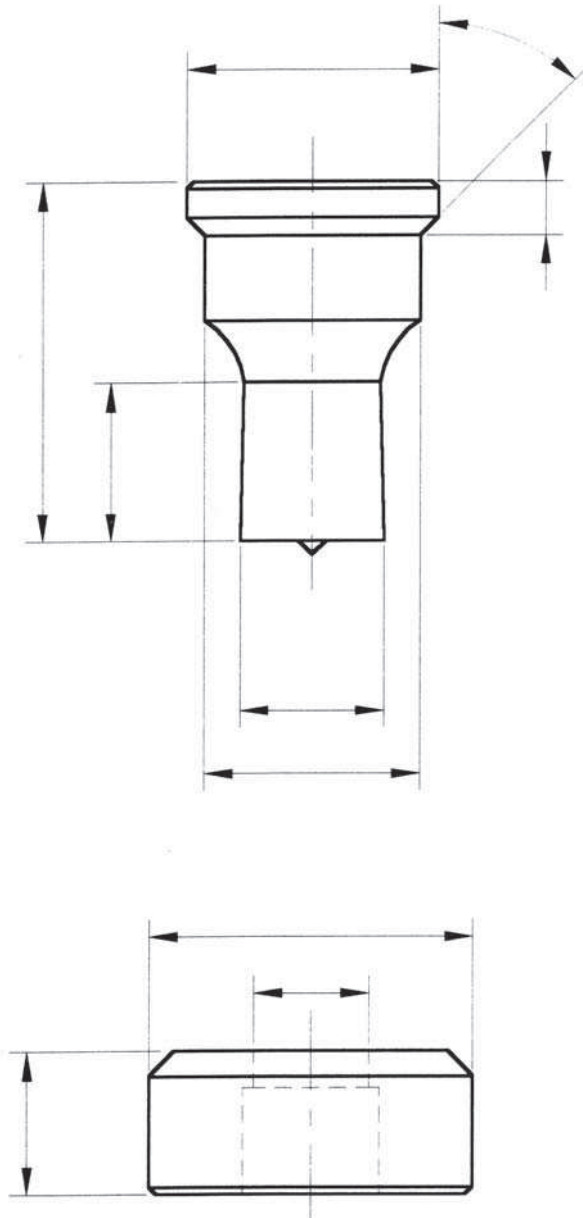


OUTCOME



SPECIAL TOOL

PUNCH AND DIE DRAWING



When specific data are missing it is necessary to fill in the drawing with provisional measures.

For shaped tools specify also position and kind of possible reference point.